

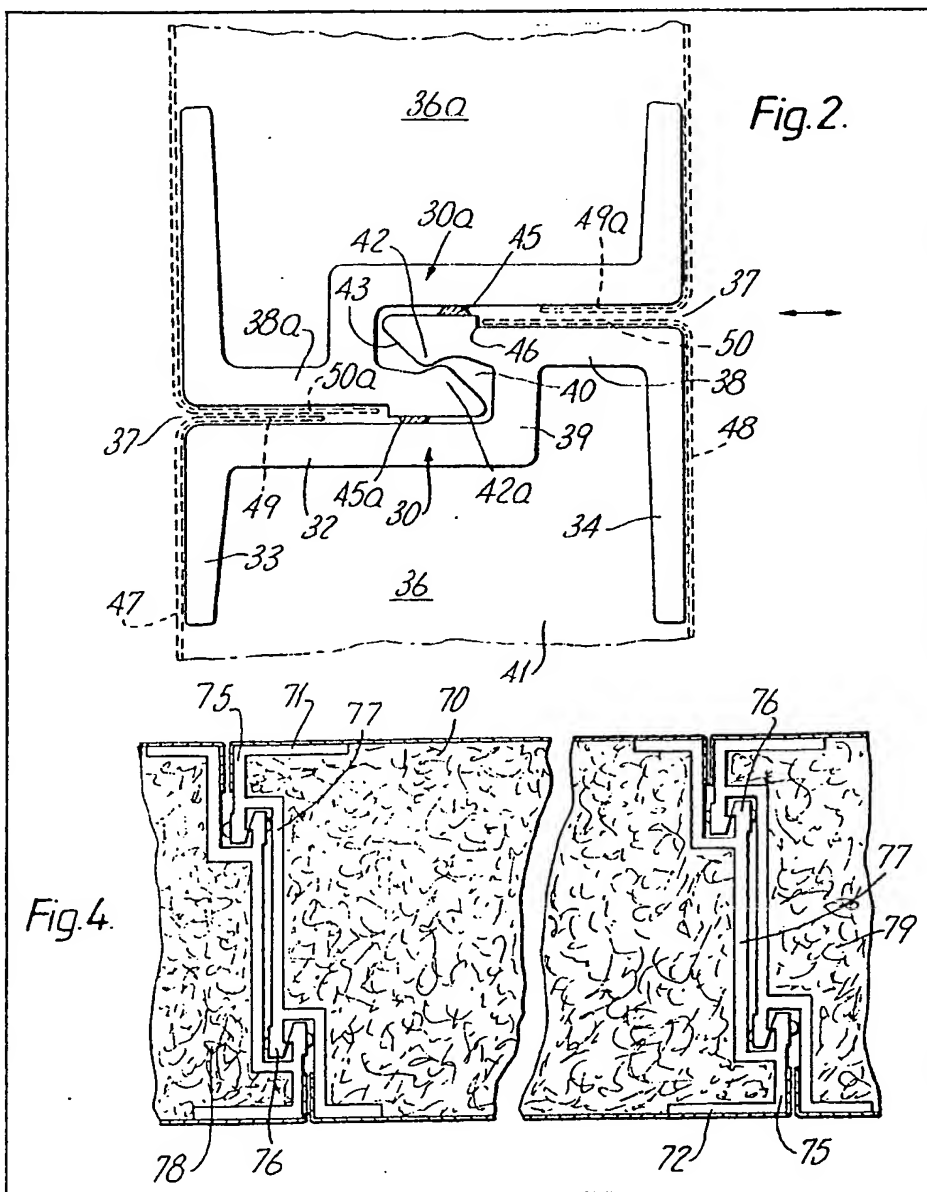
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(54) Sealed panel joint

(57) A fastener (30) comprises a longitudinally extending support intended to be secured to a panel (36). A base portion (32) forms part of the support, and a web portion (39) extends perpendicularly to the base portion and is provided with a flange (38) having an enlarged end portion (42). The flange portion, the web portion and the base portion forms an

open slot extending longitudinally of the fastener the dimensions of which will receive the flange member (42a) of a similar fastener. The enlarged end portions of the two fasteners provide an interlocking action, and this is assisted, and a weatherproof seal provided, by a longitudinally-extending resilient bead (45) which is formed on one surface of the flange portion (38). The panels may have metal cladding and an insulating core.



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Fig.1.

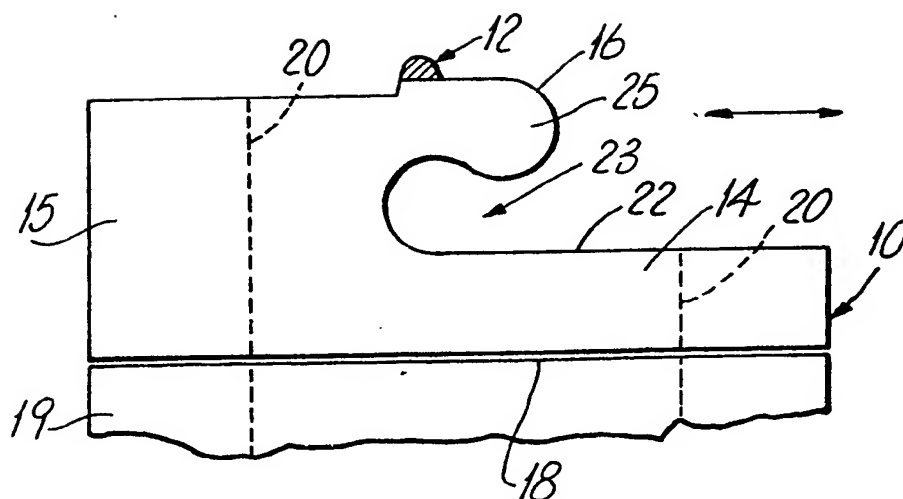


Fig.2.

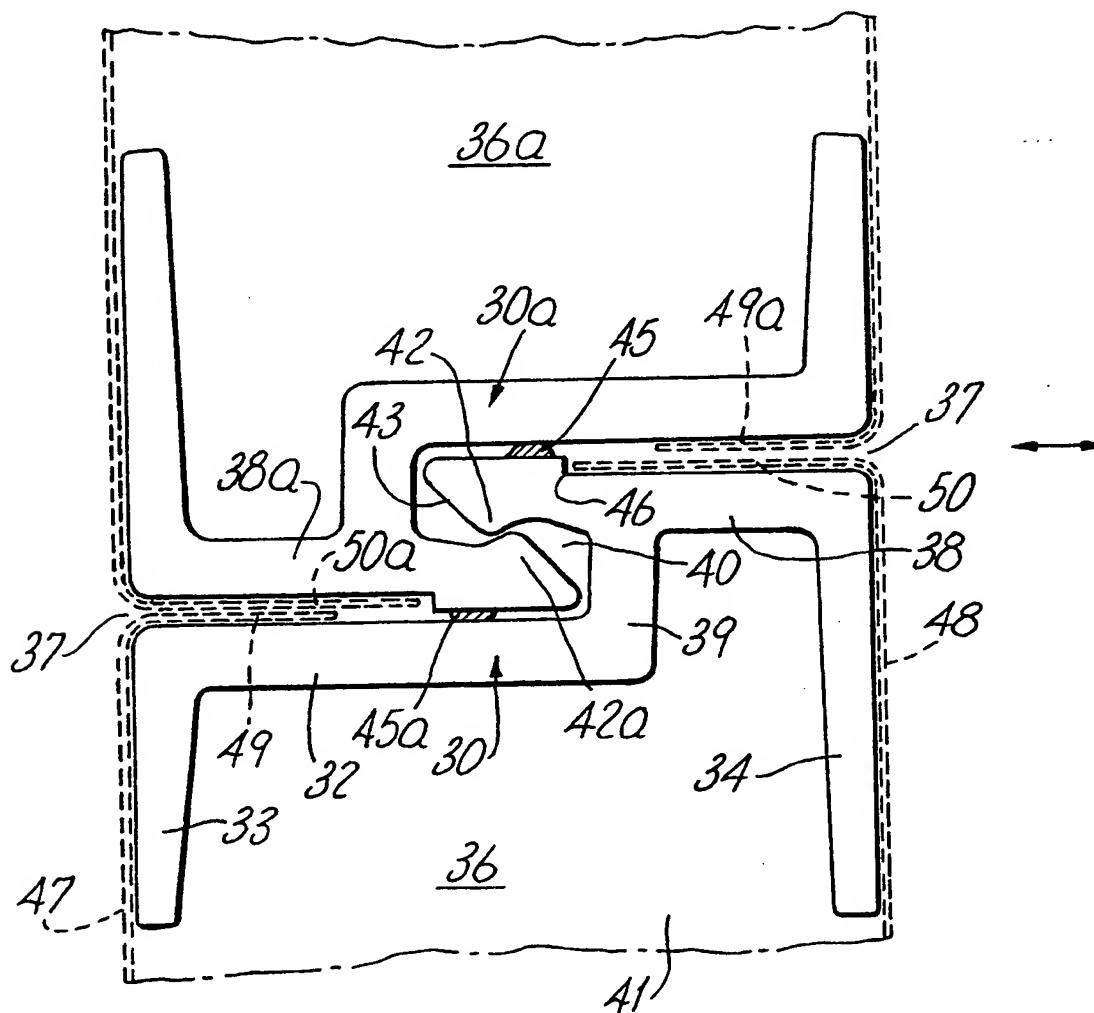
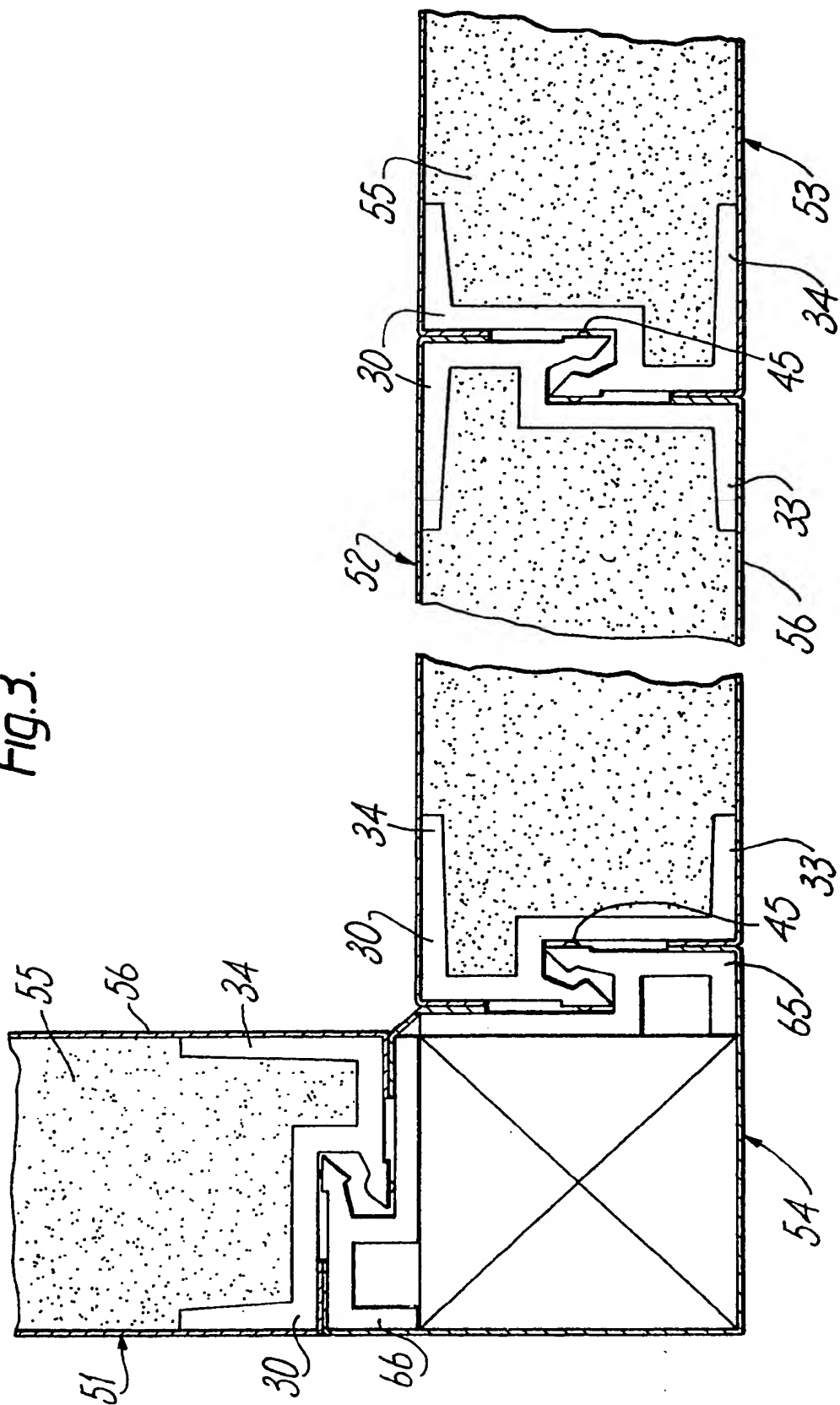
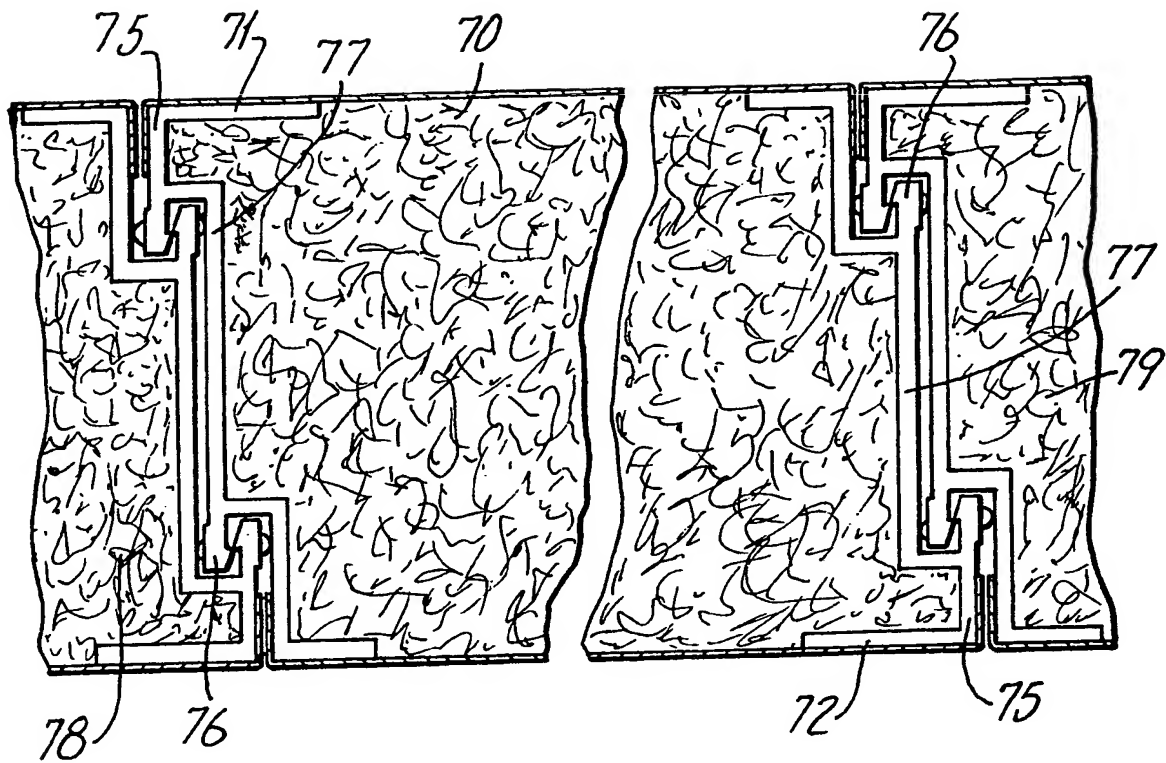


Fig. 3.



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Fig.4.



SPECIFICATION **Fastener for building element**

This invention relates to fasteners for building elements, and more particularly to fastening clips adapted to join together longitudinal surfaces of building elements such as panels used in prefabricated constructional systems.

According to the present invention, there is provided a fastener adapted to be connected to a similar fastener to interconnect longitudinally-extending surface of adjacent building elements, said fastener comprising a longitudinally extending support adapted to be secured to a building element, a base portion connected to or forming part of said support, a web portion extending from the base portion, and a flange member connected to said web portion and extending generally parallel to the base portion to form, with said base portion and said web portion, an open slot extending longitudinally of the fastener, the dimensions of said flange member and said slot being such that said slot will receive therein the flange member of a similar fastener, and the flange member comprising, on a surface facing said base portion, an enlarged end portion, and longitudinally extending resilient means provided on one surface of the fastener whereby, to sealingly interconnect two identical fasteners, the flange member of each fastener is engaged within the slot formed in the other fastener, the respective enlarged end portions passing beyond each other into the end of the slot and the longitudinally-extending resilient means of each fastener bearing on the other fastener to urge the respective flange members into close mutual engagement.

In its preferred form, the fastener comprises a longitudinally-extending clip intended to interconnect the longitudinally-extending edges of building panels in a prefabricated constructional system. The interlocking profiles of the connectors enable identical connectors to be used to interconnect adjacent panels, and the longitudinally-extending resilient means, which is generally made of a soft plastics or rubber material and comprises a bead extending along the flange member, ensures that the fasteners, when connected, provide a secure fastening joint which is moisture and vapour proof. The resilient means may alternatively or in addition extend along the base portion.

The use of a moisture seal results in the fasteners being particularly adapted for use in prefabricated heat-insulation arrangements such as cold rooms, freezers and portable stores.

Preferably, the enlarged end portion of the flange member reduces the entrance to the longitudinal slot such that a flange member of an identical fastener must be forced past this entrance into the end of the slot, where it becomes an interference fit with the other flange member. In order to assist entry into the slot, preferably the enlarged end of the flange member is tapered or rounded, and in addition the end of

the slot may also be profiled to accept such an enlarged end.

Suitably, the longitudinally extending resilient means comprises an elongate rib of soft rubber or resilient plastics material extending over the entire length of the fastener. This rib has the dual function of urging the flange members into contact and sealing the joint between the fasteners.

Suitably, the support is planar and comprises the base portion. In this form, the support may be adapted to be secured directly to the longitudinal edge of a panel, and in order to assist in such a mounting arrangement, the support may comprise the central web of a channel section, the legs of which are intended to extend around the marginal edge regions of the panel. Both legs may be integral with the support, or alternatively one of the legs may be integral with the support and the other made integral with the flange member, the web portion then being connected to the flange member intermediate its extension. Where additional fixing is required, two or more fasteners may share a common base portion, for connection to an identical multiple fastener.

Suitably, the fastener is extruded from a rigid plastics material such as high impact PVC and the resilient elongate rib may be produced at the same time in a dual extrusion process in which the resilient material is extruded simultaneously with the rigid material of the fastener.

Preferably, a fastener according to the invention is disposed along the longitudinal edge of a prefabricated panel, and this panel may be formed from any suitable material such as wood, plastics or metal, filled with a suitable packing material.

In order to interconnect panels at the corners of a prefabricated construction, the fasteners as described may be provided along one or more longitudinal edges of a corner connecting section.

The invention also comprehends a panel or a corner section incorporating a fastener as hereinbefore defined.

In order that the invention may be more fully understood, embodiments in accordance therewith will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 shows a cross-sectional view of one embodiment of fastener;

Fig. 2 shows a cross-sectional view of a second embodiment of fastener, the drawing illustrating two identical such fasteners interlocked;

Fig. 3 shows a cross-sectional view through a prefabricated building system which incorporates panels and corner sections comprises fasteners according to the invention; and

Fig. 4 is a cross-section through a panel incorporating another embodiment of fastener according to the invention.

Referring to the drawings, and more particularly to Fig. 1 thereof, this shows in cross-section a fastener adapted to be secured to the longitudinal edge of a prefabricated building panel to enable

the panel to be connected to a similar panel having an identical fastener fitted thereto.

The fastener is in the form of a fastening clip comprising an extrusion 10 of rigid material such as PVC plastics material which is bonded to or moulded integrally with a longitudinally extending compression strip 12 formed from a resilient plastics or rubber material. Suitably, the fastening clip is manufactured in a dual extrusion process in which the rigid PVC extrusion 10 is produced simultaneously with the compression strip 12, the two components becoming bonded to one another during the extrusion process.

The extrusion 10 comprises a base portion 14, a web portion 15 integral with the base portion 14, and a flange 16 integral with the web portion 15. In the embodiment shown in Fig. 1, the base portion 14 comprises a support by which the fastening element is secured to the longitudinal edge 18 of a prefabricated building panel 19, the element being secured to the edge 18 by any suitable means such as adhesive or screws (not shown) which may for example extend through the fastening clip along broken lines 20.

The upper surface 22 of base portion 14 forms, with the web 15 and flange 16, a longitudinally extending slot 23 which is adapted to receive the nose 25 of a flange 16 of an identical fastening element. As will be seen from Fig. 1, the nose 25 of flange 16 is enlarged to reduce the width of the entrance to slot 23 and to form with the remainder of the slot a profiled aperture which will engage with a similar flange 16 of an identical fastening element. This engagement is achieved by moving adjacent panels into contact in a direction at right angles to the plane of the panels, as shown by the arrows in all the Figures. In the engaged position, the compression strip 12 bears on the upper face 22 of the associated fastening element and forces the flange portions 16 into closely-fitting engagement; at the same time, strips 12 also form a vapour and water barrier which is highly effective in preventing the entry of damp into the building structure.

The engaged position of two interconnected fasteners is shown in Fig. 2, it being understood that a fastener identical to that shown in Fig. 1 can be coupled to the fastener illustrated in Fig. 1 in the same manner in order to interconnect two adjacent panels.

In Fig. 2, the fastener clips are shown respectively as 30 and 30a. As the two fasteners are identical, identical parts in the fastener clip 30a are indicated with the same reference numeral as the fastener clip 30, but are designated with an 'a' suffix.

In the embodiment shown in Fig. 2, the base portion 32 of the fastener clip 30 forms the central web of a channel-section element which incorporates legs 33 and 34 which are adapted to lie adjacent the marginal edge regions of a panel shown in broken lines at 36. In this embodiment, one of the legs 33 is integral with the base portion 32, while the other leg 34 is integral with the flange member 38, which extends beyond the web

portion 39. As will be seen from Fig. 2, in this embodiment the slot 40 is profiled in cross-section, the entrance being restricted by the enlarged portion 42 provided on the free edge of the flange 38. The edge 43 of this enlarged portion 42 is formed at an angle so as to permit a corresponding enlarged portion 42a of flange 38a to more readily pass through the restricted opening of the slot 40 and into the profiled end portion of the slot. To enable the flanges to pass into the engaged position, some deformation is necessary, and this can be achieved either by compression of strips 45, 45a, or by deformation of the enlarged portions 42, 42a.

Fig. 2 illustrates how the compression strips 45, 45a provide a double vapour seal in the gap 37 between adjacent panels 36, 36a. Additional sealing material, such as a silicone or plastics mastic, may be applied into the gap 37 between adjacent fasteners after the panels have been connected.

In the embodiment of Fig. 2, the panels 36, 36a comprise a base material 41 such as a composite board material, which is clad on both sides by sheet metal cladding 47, 48. In order to secure the fastening clips 30 to the panels, the edges of the metal cladding are folded over to form flanges 49, 50 which overlie respectively the base 32 and flange 38. Flange 38 is provided with a longitudinal recess 46 for receiving flange 50 of the cladding 48, and fastening means such as screws pass through flanges 50 and 38 and flange 49 and base 32 for this purpose.

Fig. 3 shows fastener clips similar to those illustrated in Fig. 2, used to interconnect elements in a prefabricated building system. Such a system may be used for producing prefabricated and portable buildings, or as partitioning in existing buildings, and is particularly applicable to insulated enclosures such as cold rooms and freezer units. Fig. 3 shows its application to a portable building.

In Fig. 3, fastening clips identical to those illustrated in Fig. 2 are shown, and the same reference numerals are used. As will be seen from Fig. 3, the prefabricated structure comprises a series of panels 51, 52, 53 provided, along their longitudinal edges, with fastening clips 30. Panels 52 and 53 are contiguous and interconnected by clips engaging in the manner shown in Fig. 2, whereas panels 51 and 52 are connected at right angles by a corner connector section 54. The panels are formed from a sound and heat insulating core 55 such as polyurethane, covered on both sides by a suitable cladding 56 such as PVC coated metal sheet, plastics sheet, painted steel sheet, or timber. In the embodiment shown, a finished metal sheet is used and this is folded around the fastening clips as shown in Fig. 2. The fasteners are secured to the cladding by means of rivets, screws or similar fasteners extending through the legs 33 and 34 into the core material.

Adjacent panels 52 and 53 are secured together as described in connection with Fig. 2, by forcing the clips into engagement in a direction at

right angles to the plane of the panel. After the panels have been connected, the gaps between the panels are filled with a sealing compound such as silicone rubber or mastic to ensure that no damp can penetrate through the join. The corner section 54 comprises an elongate post formed along its adjacent inner faces with fastening clips 65, 66 which are substantially identical to clips 30 and which engage the fasteners 30 on the panels 51, 52 in the same manner. In the case of the corner connectors, the entire corner section may be formed from the same material as the fastener clips, the legs thereof being integral with the walls 67 of the corner section, but in the arrangement shown in Fig. 3, the fastening clips are secured to a separate corner post.

Fig. 4 illustrates a panel 70 which is of substantial thickness compared to the panels 50, 51 and 52 shown in Fig. 3, and which for this reason is provided with fasteners 71, 72 which incorporate a dual-fastening clip arrangement. As will be seen from Fig. 4, each fastener 71, 72 incorporates two longitudinally extending flanges 75, 76 the flange 76 being formed by an extension of the base portion 77 associated with flange 75. As will be seen from Fig. 4, these dual flanges and slots engage with identical fasteners provided on the panels or corner elements 78, 79 adapted to be joined thereto. Dual fastening clips are provided where a single fastener would have insufficient mechanical strength for the thickness of the panel concerned. Clearly, fasteners having more than two clips can be provided where very thick panels need to be joined, or where high mechanical strength is required.

It will be appreciated that the invention provides a simple and inexpensive fastening element which requires only a single extrusion to produce interlocking clips capable of effectively coupling elements in a building system with a connection which is strong and moisture proof.

CLAIMS

1. A fastener adapted to be connected to a similar fastener to interconnect longitudinally-extending surfaces or adjacent constructional elements, said fastener comprising a longitudinally extending support adapted to be secured to a constructional element, a base portion connected to or forming part of said support, a web portion extending from the base portion, and a flange member connected to said web portion and extending generally parallel to the base portion to form, with said base portion and said web portion, an open slot extending longitudinally of the fastener, the dimensions of said flange member and said slot being such that said slot will receive therein the flange member of a similar fastener, and the flange member comprising on a surface

facing said base portion, an enlarged end portion, and longitudinally extending resilient means provided on one surface of the fastener whereby, to sealingly interconnect two identical fasteners, the flange member of each fastener is engaged within the slot formed in the other fastener, the respective enlarged end portions passing beyond each other into the end of the slot and the longitudinally extending resilient means of each fastener bearing on the other fastener to urge the respective flange members into close mutual engagement.

2. A fastener as claimed in Claim 1, wherein the longitudinally-extending resilient means comprises a resilient bead extending along the flange member.

3. A fastener as claimed in Claim 1 or Claim 2, wherein the enlarged end portion of the flange member reduces the entrance to the longitudinal slot such that a flange member of an identical fastener must be forced past this entrance into the end of the slot, where it becomes an interference fit with said other flange member.

4. A fastener as claimed in Claim 3, wherein the enlarged end of said flange member is tapered or rounded in order to assist entry into a slot in another flange member.

5. A fastener as claimed in any of Claims 1 to 4, wherein said support is planar and comprises said base portion, and is adapted to be secured directly to the longitudinal edge of a building panel or like constructional element.

6. A fastener as claimed in Claim 5, wherein the support comprises the central web of a channel section, the legs of which are adapted to extend around the marginal edge regions of said building panel.

7. A fastener as claimed in Claim 6, wherein one of said legs is integral with said support, and the other is integral with said flange member, and the web portion is connected to the flange member intermediate its ends.

8. A fastener as claimed in any of Claims 1 to 7, wherein its base portion is shared with a second fastener, for connection to an identical multiple fastener.

9. A fastener as claimed in any of Claims 1 to 8, wherein said fastener is extruded from a plastics material, and the longitudinally-extending resilient means is extruded simultaneously from a resilient plastics material.

10. A prefabricated constructional element, incorporating along a longitudinal edge a fastener as claimed in any of Claims 1 to 9.

11. A prefabricated corner section, incorporating along a longitudinal edge a fastener as claimed in any of Claims 1 to 9.

12. A fastener, substantially as hereinbefore described with reference to Fig. 1, Fig. 2, Fig. 3, or Fig. 4 of the accompanying drawings.

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